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EXAMINER	
ELALLAM, AHMED	
ART UNIT	**PAPER NUMBER**
2662	

DATE MAILED: 07/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/750,403	JACOBSON ET AL.	
	Examiner	Art Unit	
	AHMED ELALLAM	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23 and 27-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This responsive to Amendment filed on 4/25/2005. The Amendment has been entered.

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 8-15, 17-19, 22, and 23 is rejected under 35 U.S.C. 102(e) as being anticipated by Lyon et al, US (6,333,917).

Regarding claim 8, Lyon discloses a RED (random early detection) policer system comprising:

A RED+ engine (unit 62, figure 9) for determining an AVR-TIME implemented as an EWMA (Exponential weighted moving average), see column 16, lines 45-65. (Claimed means for determining a moving average of a virtual time debt);

DROP/TAG for determining whether to drop a packet based on the value of AVR-TIME. See column 16, lines 14-65. (Claimed means for determining whether a packet should be dropped based on a value of the moving average of the virtual time debt).

Regarding claim 9, Lyon discloses averaging time between marks to determine the TIME-AVR, wherein the marks are carried out using a marking rate generator (unit 74, figure 9). See column 16, lines 27-33 and lines 14-65. (Examiner interpreted the

marking as being the claimed means for sampling a virtual time debt at a sampling interval, and that the use of the TIME-AVR in the EWMA, as being the claimed transmitting the result to moving average determining means).

Regarding claim 10, Lyon discloses with reference to figure 10, a decision generator for generating a random number based on the result of the marking rate generator, and a counter for counting a number of packets passing through the RED engine, wherein a packet is dropped when the counter counts up to the random generated number, Figure 10, column 12, lines 52-67 and column 13, lines 1-13.

(Examiner notes that the limitation of claim 10 is taught in the incorporated article to Jacobson, see Lyon column 12, lines 14).

Regarding claim 11, Lyon, with reference to figures 4 and 5, discloses a plurality of RED engines policers (Random Early Detection), wherein each RED policer (Figure 5) include:

A marking rate generator 74 that observe the queue dynamics, see column 11, lines 58-67 and column 12, lines 1-2, the marking rate generator using an EWMA for AVR-TIME determination (marking parameter), see column 16, lines 45-65. (Claimed a filter that determine a filtered virtual time debt);

Marking decision generator 76 that receives the marking parameter for marking the packet (claimed a control law circuit that receives the virtual time debt from the filter and determines whether a packet should be dropped);

Lyon further discloses that separate red engine can be used for each class of traffic, see column 17, lines 62-67 and column 18, lines 1-3. (it is inherent to have a

classifier to determine which packet has to go to each policer, because that is needed to map the individual classes of traffic to the policer with the specific parameters of each class)

Regarding claims 12 and 14, Lyon discloses a RED (random early detection) policer system that can be implemented in hardware/and or software comprising:

A RED+ engine (unit 62, figure 9) for determining an AVR-TIME implemented as an EWMA (Exponential weighted moving average), see column 16, lines 45-65 and figure 14. (Claimed determining a virtual time dept of a traffic);

Lyon, with reference to figure 14, shows a step of comparing the AVR-TIME to a statistical criteria using an EWMA. (Examiner interpreted this step as being the claimed comparing the virtual time dept with a threshold, because the use of the EWMA applied to the arrival time is used for comparing to the available average time to the statistical criteria for marking the packet to be either conforming or non-conforming, therefore the statistical criteria is interpreted as being the claimed minimum threshold);

Lyon discloses with reference to figure 10, a decision generator for generating a random number based on the result of the marking rate generator, and a counter for counting a number of packets passing through the RED engine, wherein a packet is dropped when the counter counts up to the random generated number, Figure 10, column 12, lines 52-67 and column 13, lines 1-13.

Regarding claims 13 and 15, Lyon discloses with reference to figure 10, a decision generator for generating a random number based on the result of the marking rate generator, and a counter for counting a number of packets passing through the

RED engine, wherein a packet is dropped when the counter counts up to the random generated number, Figure 10, column 12, lines 52-67 and column 13, lines 1-13.

Regarding claim 17, Lyon discloses a method of policing packet in a network device, comprising:

A RED (random early detection) engine (unit 62, figure 9) for determining an AVR-TIME implemented as an EWMA (Exponential weighted moving average), see column 16, lines 45-65. (Claimed determining a virtual time debt of packet flowing through the network device);

DROP/TAG unit 58 for determining whether to drop a packet based on the value of AVR-TIME. See column 16, lines 14-65. (Claimed determining whether a packet should be dropped based on the virtual time debt of the packets).

Regarding claim 18, Lyon with reference to figure 14 shows a step of comparing the AVR-TIME to a statistical criteria using an EWMA. (Claimed determining that a packet should be dropped when a virtual time dept threshold has been reached). (Examiner interpreted this step as being the claimed comparing the virtual time dept with a threshold, because the use of the EWMA applied to the arrival time is used for comparing to the available average time to the statistical criteria for marking the packet to be either conforming or non-conforming, therefore the statistical criteria is interpreted as being the claimed virtual time debt threshold).

Regarding claim 19, Lyon discloses determining an AVR-TIME implemented as an EWMA (Exponential weighted moving average), see column 16, lines 45-65. (Claimed determining a moving average of the virtual time debt).

Regarding claim 22, Lyon discloses averaging time between marks to determine the TIME-AVR. See column 16, lines 27-33 and lines 14-65. (Examiner interpreted the marking as being the claimed sampling a virtual time debt at a sampling interval).

Regarding claim 23, Lyon discloses with reference to figure 10, a decision generator for generating a random number base on the result of the marking rate generator, and a counter for counting a number of packets passing through the RED engine, wherein a packet is dropped when the counter counts up to the random generated number, Figure 10, column 12, lines 52-67 and column 13, lines 1-13.

(Examiner notes that the limitation of claim 10 is taught in the incorporated article to Jacobson, see Lyon column 12, lines 14, stated differently, claim 10 can be also viewed as being unpatentable over Lyon in view of Jacobson).

2. Claims 24-26, 29-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Gracon et al, US 2002/01101134.

Regarding claim 24, Gracon, with reference to figure 3, discloses a method for policing packet in a packet scheduler (claimed network device), the method comprising:

Comparing theoretical arrival time (TAT) to the arrival time (Ta), the TAT calculated based on MIR (Maximum Information Rate), see paragraph [0039]; (Claimed determining a virtual time debt of packet flowing through the network device, the virtual time dept computed as a delay from an expected packet arrival time established by a traffic contract to an actual packet arrival time);

Determining if the TAT is greater than the sum of Ta and L (which is equivalent to claimed the virtual time debt of the packets exceeds a predetermined value, because TAT is greater than the sum of TA and L is the same as TAT-Ta greater than L (L is regarded as the predetermined value), then the packet is determined to be non-conforming and should be dropped, see [0039], (Claimed determining that packets should be dropped when the virtual time dept of the packets exceeds a predetermined value);

Choosing a packet to be dropped, in response to a random number, see [0049];

Dropping the chosen packet, see [0049].

Regarding claim 25, Gracon discloses a prior art RED policer using random number, and counting a number of packets received up to the random number and dropping the packet when the counted number reaches the random number, see paragraph [0045].

Regarding claim 26, claim 26 is a means claims and have the same scope of claim 24, further Gracon discloses a policer for implementing the method of claim 24, thus the policer is interpreted as being the claimed means in claim 26.

Regarding claim 29, Gracon, with reference to figure 3, discloses a method for policing packet in a packet scheduler (claimed network device), the method comprising:

Comparing theoretical arrival time (TAT) to the arrival time (Ta), the TAT calculated based on MIR (Maximum Information Rate), see paragraph [0039]; (Claimed determining a virtual time debt of packet flowing through the network device, the virtual

time dept computed as a delay from an expected packet arrival time established by a traffic contract to an actual packet arrival time);

Determining if the TAT is greater than the sum of Ta and L (which is equivalent to claimed the virtual time debt of the packets exceeds a predetermined value, because TAT is greater than the sum of TA and L is the same as TAT-Ta greater than L (L is regarded as the predetermined value), then the packet is determined to be non-conforming and should be dropped, see [0039], (Claimed determining that packets should be dropped when the virtual time dept of the packets exceeds a predetermined value);

Regarding claim 30, Gracon discloses

Choosing a packet to be dropped, in response to a random number, see [0049];

Dropping the chosen packet, see [0049]; wherein a prior art RED policer using random number, and counting a number of packets received up to the random number and dropping the packet when the counted number reaches the random number, see paragraph [0045].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silberschatz et al (US 6,556,578) in view of Lyon et al, US (6,333,917).

Regarding claim 1, Silberschatz discloses a policer based on Random Early Detection (RED), comprising:

determining a global average queue occupancy, figure 2a, step 321, where the average is recomputed on the arrival of each new packet at the buffer; .

comparing the global average queue occupancy to a threshold, and if average queue occupancy does not exceed the maximum threshold but is greater than a minimum threshold (step 38), a dynamically generated probability is determined for dropping the packet, see steps 36-44 and column 4, lines 27-40.

The difference between Silberschatz teaching and the limitations of claim 1, is that that the dropping of packet is based on time variable and not the buffer occupancy.

However, Lyon discloses in the same field of random early detection algorithm, marking packets based on EWMA time-based method (Exponential weighted moving average time), see column 16, lines 14-65. (Examiner interpreted the claimed filtered virtual time dept as being equivalent to the EWMA based AVR-TIME disclosed by Lyon, because, in accordance with the instant application the filtered virtual time debt is implemented as exponential weighted moving average, EWMA, which is the average packet flow with a weight factor to determine how previously inputted packets affect the mean value compared to more recent packets).

Therefore, it would have being obvious to an ordinary person of skill in the art, at the time the invention was made to drop the packet using the time based dropping

taught by Lyon instead of buffer occupancy method of Silberschatz so that time delays between source and destination are accounted for in policing the traffic. The advantage would be having a discard rate rather than a discard probability (Lyon column 2, lines 61-66) resulting in a more deterministic approach when to drop a packet.

Regarding claim 5, Silberschatz incorporated article of Morris et al, sections 4.4 and 4.5 discloses the use of sampling at the arrival time of the packet used for the calculation of the EWMA, see column 4, lines 11-26. (A sampler is needed for sampling at sampling interval for the determination of the EWMA by the filter).

Regarding claims 6, Silberschatz discloses generating a random number r having a value between zero and maximum probability, and then indicating that a packet must be dropped when the random value is less than or equal to the maximum probability; column 4 lines 34-40, and that after selection of a random number, the packet is dropped when the random value is less than or equal to the maximum probability. The count value can be incremented every time max probability is computed and reset to zero whenever a packet is dropped. The initial packet dropping probability is empirically chosen based on link speeds to ensure an appropriate number of packet drops per second when the minimum queue length threshold is exceeded; column 4 lines 34-57.

Silberschatz discloses all the limitation of claim 6, except it does not specify a generator and a counter.

However, it would have been obvious to an ordinary person of skill in the art at the time the invention was made to provide a generator and a counter within the policer of Silberschatz so that the method of RED policer of Silberschatz can be implemented.

Regarding claim 7, Silberschatz discloses if the queue average does not exceed the maximum threshold but is greater than a minimum threshold (step 38), a dynamically generated probability p.sub.a is determined (step 40) and applied such that the probability of a packet drop indication being provided is p-sub-a; column 4 lines 26-40; Silberschatz further discloses generating a random number r having a value between zero and the maximum value of p.sub.a, and then indicating that a packet must be dropped when r is less than or equal to p.sub.a (steps 42, 36), and if the average is less than the minimum threshold, then no packet drop indication is provided. (steps 44, 38), see also column 4 lines 26d0). (Claimed determining a probability of a packet being dropped based on the filtered time debt exceeding a predetermined minimum threshold, and specifies a range of numbers based on the probability the random generator that randomly generates a number in the range)

Silberschatz/Lyon do not specify the control law for carrying the determination of the dropping probability. However, it would have been obvious to an ordinary person of skill in the art at the time the invention was made to provide a controller for implementing the dropping probability as taught by Silberschatz/Lyon. A person would be motivated to have the means necessary for implementing the policing method of Silberschatz/Lyon.

4. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silberschatz in view of Lyon as applied to claim 1 above, and further in view of Fahmi et al, US (6,108,303).

Regarding claims 2 and 3, claim 2 recites that the virtual time debt uses a time T in which a packet is expected to arrive and is computed using a predetermined output transmission rate. (In accordance with the specification the time T is understood as being the theoretical (virtual) time that may be contracted to a user , see specification page 8, lines 23-25).

Lyon in view of Silberschatz discloses the AVR-TIME uses the time the packet actually arrived but not a time in which the packet is expected to arrive (claimed virtual time debt uses a time T).

However, Fahmi discloses marking cell based on TAT (theoretical arrival time), wherein the TAT can be computed based on traffic contact (claimed output rate as in claim 2, and claimed transmission rate is based on traffic contract as in claim 3). See column 3, lines 1-34.

Therefore, it would have being obvious to an ordinary person of skill in the art at the time the invention was made to use the TAT as defined by Fahmi in addition to the arrival time of Silberschatz/Lyon in determining AVR-TIME instead of simply the actual arrival time so that different thresholds can be assigned to different classes of traffic in accordance with the traffic contract a along with considering delays occurred from the source of traffic. The advantage would be the ability of Silberschatz/Lyon method to be practiced in nodes (i.e. switch) by policing different classes of traffic using different dropping thresholds for each different class of traffic.

Regarding claim 4, claim 4 recites that the filter is based on an exponential weighted moving average (EWMA) virtual time delay using the equation $EWMA_k = (1-g)$

$EWMA_{k-1}$+ g $(VTD)_k$, the VTD is the virtual time dept, and VTD is the difference between the time the packet is expected to arrive and the time the packet actual arrived.

Silberschatz discloses a RED policer of claim 1, wherein the filter is based on an exponential weighted moving average (EWMA) virtual time delay using the expression, EWMA = (1-g) EWMA+ g (VTD), (Silberschatz discloses red policer in the article of Morris et al section 4.5 column 2, a "calculate average queue length" formula that uses the same variables for the equation avg = (1-wq)*avg + wq*q), wherein Avg is EWMA, wq is the filter gain, g, and q is the sampled queue size at the instant time, section 4.4, 4.5 of Morris indicated in the specification at column 4, lines 18-23).

The difference between the claimed limitation and the teaching of Silberschatz, is that the filter of Silberschatz uses an EWMA buffer occupancy (average buffer occupancy) instead of EWMA time debt (VTD, difference of packet time arrival).

Lyon discloses in the same field of random early detection algorithm, marking packets based on EWMA time-based method (Exponential weighted moving average time based on the arrival of the packet), see column 16, lines 14-65.

Lyon in view of Silberschatz discloses the AVR-TIME uses time the packet actually arrived but not a time in which the packet is expected to arrive.

However, Fahmi discloses marking cell based on the difference between the actual arrival time and the expected arrival time of the packet (TAT). See column 3, lines 1-34.

Therefore, it would have being obvious to an ordinary person of skill in the art, at the time the invention was made to use the time delay teaching of Fahmi (claimed VTD)

in the implementation of AVR-TIME of Silberschatz/Lyon using the "VTD" instead of arrival time only so that policing traffic in the system of Silberschatz/Lyon would account for variable delays from the source of traffic in implementing the dropping probabilities along each different class of traffic. The advantage would be the ability of Silberschatz/Lyon method to be practiced in nodes (i.e. switch) by policing different classes of traffic and making the dropping of packets more deterministic by having more accurate time delay variations that are used in the calculation of AVR-TIME values.

5. Claims 16 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyon in view of Subramaniam et al, US (6,640,302).

Regarding claim 16, Claim 16 recites the same limitation of method claim 12, except that it does not specify that the method can be practiced using electromagnetic signals propagating over a computer network and carrying instruction for implementing the method.

However, Subramaniam discloses using electromagnetic signals propagating on a computer network, electromagnetic signals carrying instructions for execution on a server for the practice of a method claim. See claim 28.

Therefore, it would have being obvious to an ordinary person of skill in the art, at the time the invention was made to implement the RED policing method of Lyon using electromagnetic signals propagating on a computer network as disclosed by Subramaniam so instructions for computer implemented method of Lyon can be transmitted remotely over a computer network. The advantage would be the ability to

remotely program the computers that implement the method of Lyon in a dynamic fashion.

Regarding claim 28, Claim 28 recites the same limitation of method claim 17, except that it does not specify that the method can be practiced using electromagnetic signals propagating over a computer network and carrying instruction for implementing the method.

However, Subramaniam discloses using electromagnetic signals propagating on a computer network, electromagnetic signals carrying instructions for execution on a server for the practice of a method claim. See claim 28.

Therefore, it would have being obvious to an ordinary person of skill in the art, at the time the invention was made to implement the RED policing method of Lyon using electromagnetic signals propagating on a computer network as disclosed by Subramaniam so instructions for computer implemented method of Lyon can be transmitted remotely over a computer network. The advantage would be the ability to remotely program the computers that implement the method of Lyon in a dynamic manner.

6. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyon in view of Fahmi et al, US (6,108,303).

Regarding claim 20, Lyon discloses substantially all the limitations of parent claim 17. In addition Lyon discloses the AVR-TIME based on the arrival time of the packet.

The difference between Lyon teaching and the claimed limitation of claim 20, is that Lyon uses the arrival time of the packet and not the difference between the arrival time and the theoretical arrival time of the packet.

However, Fahmi discloses marking cell based on the difference between the actual arrival time and the expected arrival time of the packet (TAT-Ta) to mark the cell as conforming or non-conforming. See column 3, lines 1-34.

Therefore, it would have being obvious to an ordinary person of skill in the art, at the time the invention was made to use the time delay teaching of Fahmi (claimed VTD) in the implementation of AVR-TIME of Lyon instead of arrival time only so that policing traffic in the system of Lyon would account for the delay incurred between the source of the traffic and the device shaping the traffic. The advantage would be the ability of Lyon to apply the EWMA to the "time difference" instead of arrival time only resulting in more deterministic approach of dropping the packets, since fluctuations in time delays would be accounted for.

Regarding claim 21, Lyon does not specifically discloses a calculating the time a packet is expected to arrive according to a traffic contract.

However, Fahmi discloses marking cell based on TAT (theoretical arrival time) (claimed arrival time), wherein the TAT can be computed based on traffic contact. See column 3, lines 1-34. (Claimed calculating the time a packet is expected to arrive according to a traffic contract).

Therefore, it would have being obvious to an ordinary person of skill in the art at the time the invention was made to use the (TAT-Ta) variable as defined by Fahmi in

the determination of the AVR-TIME of Lyon instead of simply the actual arrival time of the packet so that different thresholds can be assigned to different classes of traffic in accordance with the traffic contract. The advantage would be the ability of Lyon method to be practiced in nodes for policing different classes of traffic that have different traffic contract, resulting in more efficient use of the network bandwidth and accounting for delay fluctuations of different classes of traffic in determining the dropping probabilities as a function of thresholds.

7. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lyon, US (6,333,917).

Regarding claim 27, Lyon discloses all the limitations of claim 27 (claim 27 is a computer readable media containing instructions for execution in a processor for the practice of method claim 17).

Lyon does not disclose a computer readable media containing instructions for execution in a processor for the practice of method claim 17.

Examiner takes official notice that computer readable media containing instructions for execution in a processor for the practicing methods is well known in the art, since official office is taken, It would have been obvious to an ordinary person of skill in the art to have the method of claim 17 being implemented using instructions embedded in a computer readable media. The advantage would be the ability to store the instructions for implementing the method of Lyon in various storage mediums such as electronic storage, magnetic storage, optical storage, etc such mediums are

advantageous in the industry, for example, portability, electronic distribution of the product, remote testing, etc...

Response to Arguments

8. Applicant's arguments with respect to claim 1-16 have been considered but are moot in view of the new ground(s) of rejection.

Rejections under 35 USC § 102:

Claim 8-15,17-19 and 22-23:

Applicants argue that Lyon (US 6,333,917) does not discloses the limitations of claim 8, because Lyon does not discloses "***determining whether a packet should be dropped based on ...the virtual time debt.***" (Emphasis added), Applicants further argue, that because Lyon does not teach, *"using a virtual time debt calculation when determining which packet to drop. By calculating the delay from the expected packet arrival time to the actual packet arrival time*". Examiner notes that claim 8 does not specify that the virtual time debt is determined by "*calculating the delay from the expected packet arrival time to the actual packet arrival time", and* the claimed subject matter can be broadly interpreted as being taught by Lyon. More specifically claim 8 recites: A policer based on Random Early Detection (RED) comprising:

means for determining a moving average of a virtual time debt; and

means for determining whether a packet should be dropped based on a value of the moving virtual time debt.

Lyon discloses a RED+ engine (policer based on Random Early Detection (RED)) that determined a moving average of an AVR-TIME, the AVR-TIME is equated as being the claimed "virtual time debt", because the claimed "virtual time debt", does not specify the alleged *"the delay from the expected packet arrival time to the actual packet arrival time".* In addition Lyon discloses dropping a packet based on the congestion of the queue, and since the queue congestion is proportional to the AVR-TIME it can be regarded as the claimed determining whether a packet should be dropped based on a value of the moving average of the virtual time debt. See Lyon column 16, lines 45-65.

Applicants lack argument with reference to claims *9-15,17-19 and 22-23.* Examiner believes the lack of argument with reference to these claims amount to the similar scope of claims 11, 12, 14, 16, and 17. Therefore these claims are subject to similar remarks as indicated above with reference to claim 8.

Rejections under 35 USC § 103:

Claims 1, 5-7:

Applicants argue that *for the reasons set forth with respect to representative claim 8, the Silberschatz patent and the Lyon patent, either taken singly or in combination, are legally insufficient to render the presently claimed invention obvious, because of the absence of Applicant's claimed novel determining whether a packet should be dropped based on ... the virtual time debt"* . Examiner disagrees, Lyon as discussed above with reference to claim 8, discloses the AVR-TIME as being the claimed virtual time debt, and Silberschatz discloses substantially all the limitation of

claim 1, with the difference that the dropping of packet of Silberschatz is based buffer occupancy and not time variable . Examiner had shown that a skilled artisan would be motivated to drop the packet using the time based dropping taught by Lyon instead of buffer occupancy method of Silberschatz so that time delays between source and destination are accounted for in policing the traffic, and it is advantageous to have a discard rate rather than a discard probability (Lyon column 2, lines 61-66) resulting in a more deterministic approach when to drop a packet, Examiner believes that a *prima facie* case of obviousness has been established.

Claims 2-4:

Applicants argue that claims 2-4 depends from allowable claim 1, and therefore they are patentable over Silberschatz in view of Lyon and further in view of Fahmi. Examiner respectfully disagrees for the same reason discussed above with reference to Lyon (claim 8), claims 2-4 are unpatentable over Silberschatz in view of Lyon and further in view of Fahmi

Claims 16 and 28:

Applicant argue that Subramanian only discloses electromagnetic signals, and for the reasons set forth with reference to claim 8, Lyon and Subramanian, either taken singly or in combination, do not disclose "determining whether a packet should be dropped based on...the virtual time debt". Examiner disagrees, the Subramanian reference uses electromagnetic signals for propagating signal carrying instructions, claims 16 and 28 are identical in scope of claim 12. Examiner has shown that Lyon discloses all the limitations of claim 12 with the exception of the electromagnetic signal

propagation. Examiner believes that a prima facie case of obviousness has been established.

Claims 20-21:

Applicants argue that claims 20-21 depends from allowable claim 17. Examiner respectfully disagrees. Claim 17 is rejected for the same reasons indicated above with reference to claim 8. Therefore the claims 20-21 are unpatentable over Lyon in view of Fahmi.

Claim 24-26:

Examiner noted Applicant argument with reference to Gracon. However the amendment to claims 24 and 26 do not specify that the delay is positive (packets are received later than expected), such delay can be interpreted as a negative delay, in which case the art of Gracon is properly maintained.

Claim 27:

Applicants argue that claim 27 is patentable for similar reasons as indicated with reference to claim 8. Examiner disagrees. Claim 27is a computer readable media containing instructions for execution in a processor for the practice of method claim 17). Examiner notes that computer readable media containing instructions for execution in a processor for the practicing methods is notoriously well known in the art, and it would have been obvious to an ordinary person of skill in the art to have the method of claim 17 being implemented using instructions embedded in a computer readable media, because it is advantageous to be able to store the instructions for implementing the method of Lyon in various storage mediums such as electronic storage, magnetic

storage, optical storage, etc such mediums are advantageous in the industry, for example, portability, electronic distribution of the product, remote testing, etc...

Finally, Examiner believes, given the broadest reasonable interpretation of the claim limitations, that rejection above is proper.

Claims 29-30:

Claim 29 has been added, the claim does not specify that the delay is positive, and thus for similar reasons set forth avove with reference to claims 24-26, the Gracon reference does discloses the invention as stated in claim 29 and 30.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Larson, US (4,569,042); Bonomi et al, US (5,864,540); Giroux et al, US (6,198,743); and Prasad US (6,381,214).

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AHMED ELALLAM whose telephone number is (571) 272-3097. The examiner can normally be reached on 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kizou Hassan can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AHMED ELALLAM
Examiner
Art Unit 2662
July 13, 2005

HASSAN KIZOU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600